HP Performance Optimized Datacenter 20c Site Preparation and Requirements Guide—International

Abstract

This document provides site preparation guidance and requirements for the HP Performance Optimized Datacenter 20c (HP POD 20c).

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Overview

About this document

This document outlines the site and preparation requirements for a 6 m (20 ft) HP POD 20c as it is being released internationally. The customer must provide a qualified architectural or consulting engineering team to generate site-specific documents for each HP POD 20c installation, including final site drawings. The customer site installation design must comply with all national, regional, and local regulations, ordinances, codes, and the specifications that are listed in this document.

This guide is part of the core documentation for the HP POD 20c. The actual location of various components or included subsystems and their operation in your HP POD 20c might vary from what is described in this document. For information specific to your HP POD 20c, see the drawings that are included in the *Operations and Maintenance Manual for the HP Performance Optimized Datacenter 20c*, or contact HP.

Safety and IEC compliance

The HP POD 20c is examined, tested, and found to be in compliance with IEC/EN 60950 Part 1 and Part 22 as an Information Technology Product. For more information, see "HP POD 20c regulatory compliance (on page 32)."

The HP POD 20c is not suitable for long-term human occupancy. The HP POD 20c is Listed as a Product that provides service access areas for periodic maintenance and service. These areas must be used only by owner-authorized and qualified personnel who are trained in the maintenance and service of the HP POD 20c components.

IMPORTANT: Before installing the HP POD 20c, consult your local Authorities for applicable regulations and to review site-specific location guidelines. If needed, obtain any necessary permits.

Additional considerations for safety and Electrical compliance are as follows:

- The HP POD 20c is Certified as an Information Technology Product to IEC/EN 60950 Part 1 and Part 22.
- The HP POD 20c is evaluated as a "non-inhabitable product" that provides "service access" areas for customer-authorized, qualified, and trained service personnel.
- The electrical connections of the HP POD 20c are evaluated as feeder connections for connection to an existing facility, and are not suitable as "service entrance" for connection to the utility.
- The HP POD 20c is designed for stationary installation outdoors in a Pollution Degree 3 environment, in restricted access locations, with field wiring terminals provided for permanent supply connections.
- The HP POD 20c meets the following ratings.

Feature	Specification
Category	Rated Overvoltage Category III
Protection	Surge protection device

Feature	Specification
Class	Class1
Ambient temperature	2°C to 54°C (35.6°F to 129.2°F)
Relative humidity	0% to 100% humidity

- As part of the overall certification, relevant sections of the International Building Code have been applied as part of the design and evaluation. The current design supports wind loads up to 144.84 kph (90 mph).

Site assessment

HP requires a detailed site assessment prior to planning and preparing the customer site location for the HP POD 20c. Consult with HP to schedule a site assessment.

Site preparation

Site preparation must be complete before the delivery of the POD for a timely installation and commissioning. The site must meet all pad, power, and chilled water requirements.

Site safety and security

Each customer site must have its own standard safety and security requirements. The HP Program Managers work with the customer to ensure adherence to the appropriate precautions. HP is not responsible for determining or enforcing safety or security requirements. The customer must conduct all health and safety evaluations of the HP POD 20c, only using HP as a support mechanism.

Fire detection and suppression

The fire suppression system, supplied as an optional component for the HP POD 20c, is a "Manufacturer Designed" system specifically designed for this HP product, in compliance with national standards.

The HP standard suppression system includes a Novec 1230 clean agent system. However, if the customer or local Authorities require specific modifications or a replacement, HP can assist in these actions at the expense of the customer.

HP does not certify that the fire suppression system that is installed in the HP POD 20c meets all local and jurisdictional requirements. The customer is responsible for the following actions as related to the fire suppression system:

- Verifying that the POD suppression system meets local codes, including specific local requirements for initial and periodic inspections
- Arranging for and receiving all required local permits, including initial commissioning as well as standard and repair maintenance
- Arranging for the connection of the agent tanks, refilling of tanks, and all system testing, including pressure tests. All general maintenance of the suppression system must be completed by an authorized technician.

Additional local requirements are not covered as part of the option price or basic installation and deployment services, unless specifically included in an executed Statement of Work.

HP POD 20c capacities

HP POD 20c capacity limitations

The capacity limitations for the HP POD 20c are separated into two categories: electrical power and mechanical cooling capacities. Both of these categories are interdependent and must be considered in conjunction with the overall customer requirements.

Electrical power capacities (critical IT power)

The electrical system of the HP POD 20c contains two main feeds, A and B, that are each rated at 320 A 380-415 VAC Wye 3-Phase. The HP POD 20c has two critical IT load circuits that are each rated at 200 A, which electrically limits the POD regardless of the redundancy configuration.

Mechanical cooling capacities

The HP POD 20c cooling system consists of 3 zones. Each zone includes 2 heat exchangers and 12 fans. Cooling capacities are based on:

- Chilled water inlet temperature of 15.6°C (60°F)
- Pure water cooling
- Chilled water flow rate of 454 lpm (120 gpm)
- Average air flow of 1700 cfm per rack

Overall system capacities

The HP POD 20c overall system capacities are provided in the following table. The customer must know the level of redundancy required for the application and its associated limiting factor.

Redundancy level	**Electrical (kW)**	**Thermal (kW)**	**Limiting factor**
N	263 – 288	300	Electrical
2N	132 – 144	150	Electrical

The electrical limitation factors are described in "Electrical power capacities (critical IT power) (on page 7)."

Site requirements

Site pad

The structural design of the HP POD 20c site pad must be based on the specific weight load of the complete POD solution with IT installed, as well as any additional equipment. During design calculations, HP recommends that you provide structural support along the entire perimeter of the POD and use the maximum allowable POD weight.

Upon installation, the POD structure must be leveled to less than or equal to 0.5°. Shimming is allowed around the perimeter of the POD to ensure that the POD remains level. If significant shimming is required, shims should be spaced no less than 1.2 m (4 ft) apart to ensure sufficient load transfer. Shims are not included.

IMPORTANT: The HP POD 20c is designed for ground level installation. If you install the HP POD 20c on an elevated surface, verify that the minimum height requirements for circuit breaker actuators are considered per national, regional, and local regulations and electrical codes. The area in front of the outside panels must include a work platform.

HP POD 20c weight

IMPORTANT: The weight provided is a minimum and an absolute maximum rated weight. The total weight of the HP POD 20c differs based on the IT equipment and optional components purchased and installed.

The overall weight might significantly vary depending on the final customer-chosen solution for the HP POD 20c. Each site pad must meet the weight requirements of the equipment that is expected to be installed.

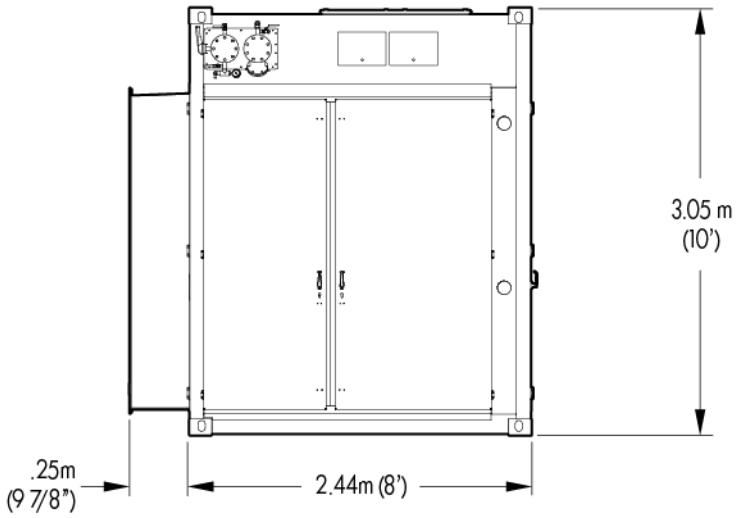
The HP POD 20c must be installed on a surface capable of supporting the following weights:

- HP POD 20c with no IT equipment installed—Approximately 7,711 kg (17,000 lb)
- HP POD 20c with IT equipment installed—Maximum 22,680 kg (50,000 lb)

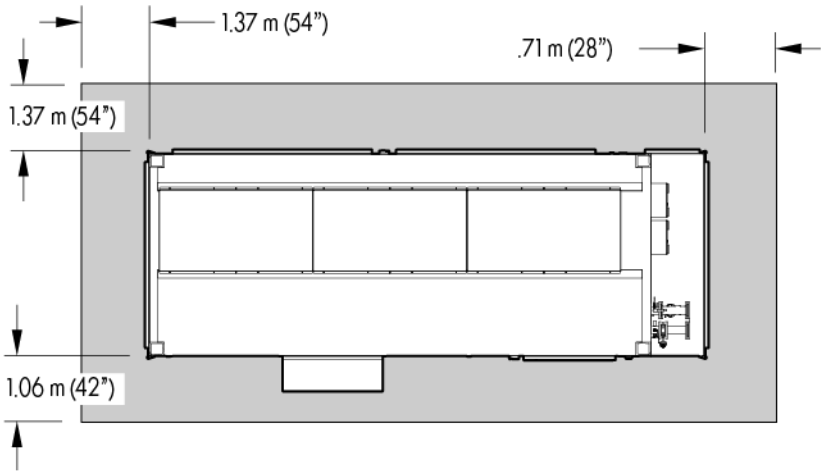
Dimensions and clearances

The selected site for the HP POD 20c must be large enough to install, service, maintain, and provide space for potential growth or expansion with additional PODs.

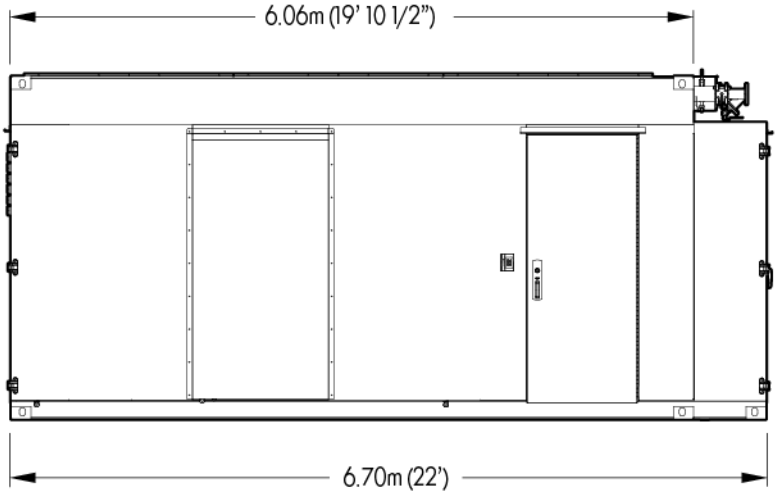
End 1 view clearances shown



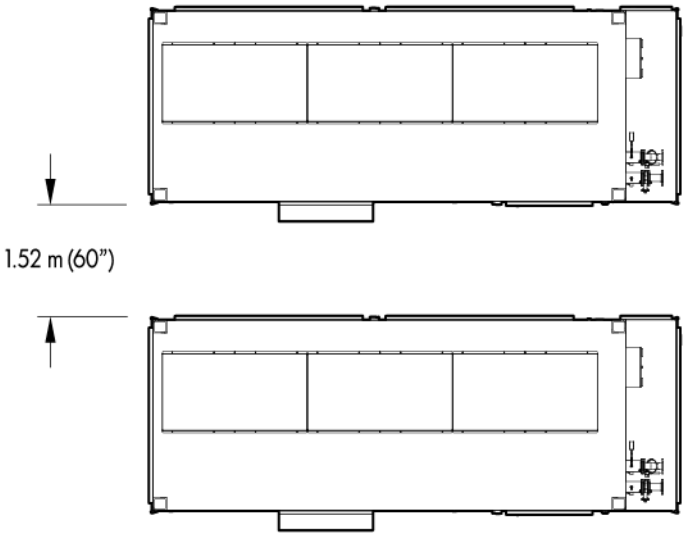
Top view keep-out and door swing clearances shown (shaded areas indicate the required clearance)



Side view clearances shown



Top view for multiple POD installation minimum clearances shown



Adequate space around the HP POD 20c is necessary for minimum door clearance.

These minimum clearances provide room for door opening only. Consider additional space as necessary for your site.

Future expansions

When selecting a site location, consider future space and accessibility requirements. Adequate space around the HP POD 20c is necessary for locating additional equipment within close proximity, such as generators and UPS devices. When installing additional equipment within close proximity to the HP POD 20c, consult with HP for site locations.

For specific space requirements, see "Dimensions and clearances (on page 8)."

Grounding requirements

The HP POD 20c structure and internal components are all bonded together. A common grounding electrode conductor connection point is provided on the utility-end cold aisle.

WARNING: To avoid the risk of personal injury or electric shock, the HP POD 20c must be properly grounded (earthed) in accordance with national, regional, and local regulations.

The following is a list of component requirements for grounding and bonding:

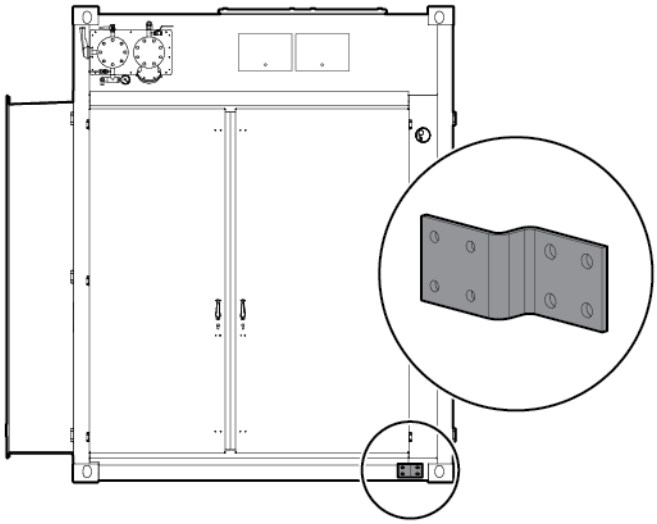
- Grounding of the HP POD 20c must comply with the requirements of IEC 364 and any applicable national, regional, and local regulations.
- Bonding of the piping systems and any exposed structural steel installed to support the HP POD 20c must be in accordance with IEC 364 and any applicable national, regional, and local regulations.

Grounding feature	Specification
Earthing (grounding) electrode conductor pad	• The earthing (grounding) electrode conductor connection bus pad is located on the outside of the HP POD 20c on the hot aisle side of the utility end of the POD and below the transformer cabinet. • The earthing (grounding) pad must be connected to the grounding electrode system or building steel in accordance with IEC 364 or equivalent regulation.
Grounding lugs	• Grounding lugs cannot be attached to any painted surface. • Grounding lugs must be compression-type 2-hole lugs and UL listed specifically for grounding.
Earthing (grounding) rod system or ground well	The customer must provide an effective earthing (grounding) system with a ground rod or a ground well.

IMPORTANT: Before installing the HP POD 20c, consult your local Authorities for applicable regulations and to review site-specific location guidelines. If needed, obtain any necessary permits.

The following figure shows the earthing (grounding) electrode conductor connection that is located on the cold aisle of the HP POD 20c.

Front view shown



Utilities

Consider the proximity to required utilities, such as power, water, and network connections. While the required utilities can be brought to nearly any selected site, there is the potential for increased costs and decreased efficiency when the HP POD 20c is located farther from the utility sources.

For utility clearance information, see "Dimensions and clearances (on page 8)."

Humidifier water supply

The HP POD 20c requires supply water for the humidifier. The supply water must meet the following requirements.

Requirement	Specification
Pressure	Between 20 and 110 psi, 0.1 and 0.8 MPa
Temperature	Between 1° and 40°C (33° and 104°F)
Minimum flow rate	1.45 lpm (0.12 gpm)
Connection	1.9 cm (.75 in) G Adapter to 1.9 cm (.75 in) FPS
Hardness	No greater than 40°fH (equal to 400 ppm of $CaCO_3$)
Conductivity	100 to 1250 µS/cm
Organic compounds	None
Type of water	Drinking water. Do not use de-mineralized or softened water.
Instant water fill flow rate	0.6 lpm (0.16 gpm)
Humidifier	For the exact requirements, see the humidifier documentation.

IMPORTANT: If your water is out of range, consult a water quality expert.

In addition to the previous requirements, observe the following requirements and recommendations:

- Do not treat the water with softeners. Softeners can produce foam, which affects the operation of the unit.
- Do not use well water, industrial water, water from cooling circuits, or water contaminated by any chemicals or bacteria.
- Do not add potential irritants to the water, such as disinfectants or anti-corrosive compounds.
- The manufacturer recommends installing an in-line filter for the water supply. It is your responsibility to determine if a filter should be installed, and if so, its location. The filter cannot be installed inside the HP POD 20c and must be compatible with the type of humidifier that is installed.

For more information, see the *Operations and Maintenance Manual* or the *HP Performance Optimized Datacenter 20c Maintenance and Service Guide.*

Drainage

Requirement	Location	Specification
Condensate drains	Hot aisle side (2)	3.18 cm (1.25 in) drain line and 26.5 lpm (7 gpm) max
Chill Water Header drains	Cold aisle side (2)	3.18 cm (1.25 in) drain line and 26.5 lpm (7 gpm) max
Humidifier drain	Cold aisle side (1)	3.18 cm (1.25 in) drain line and 26.5 lpm (7 gpm) max

Chilled water supply

The following are the water quality requirements and specifications:

- Closed-loop water must not contain any lime scale deposits or loose debris.
- The temperature of the chilled water supplied to the HP POD 20c must be 12°C to 24°C (55°F to 75°F).

CAUTION: Freezing water can cause a blockage and damage to the unit. In outside locations that are subject to freezing temperatures, an additive such as glycol might be necessary to lower the freezing point. However, since the heat transfer potential of water with glycol is lower, the HP POD 20c must be de-rated accordingly.

IMPORTANT: The chilled water system piping and heat exchangers must be drained completely, and then purged using compressed air when storing or transporting at or below freezing temperatures.

IMPORTANT: Operating the chilled water system at the higher end of the acceptable range decreases the overall thermal capacity of the POD.

Acceptable water quality specifications

Water must be maintained per the following acceptable water quality standards.

Parameter	Range
pH	8.0–10
Specific conductance at 25°C (77°F)	10–2500 µmhos
Alkalinity ("M" as $CaCO_3$)	150–1000 ppm
Sulfur (SO_4)	0–150 ppm
Chloride (Cl)	0–100 ppm
Hardness ($CaCO_3$)	0–350 ppm

Parameter	Range
Calcium hardness ($CaCO_3$)	0–200 ppm
Magnesium hardness ($CaCO_3$)	0–150 ppm
Copper (Cu)	< 0.20 ppm
Iron (Fe)	< 3.0 ppm
Aluminum (Al)	< 0.50 ppm
Sodium (Na)	0–1000 ppm
Silica (SiO_2)	0–150 ppm
Zinc (Zn)	< 1.0 ppm
Manganese (Mn)	< 0.1 ppm
Phosphate Ortho- (PO_4)	< 3 ppm
Bacteria	< 1000 CFU/ml
Suspended solids	< 10 ppm

If your water is out of range, consult a water quality expert.

The following table describes the chilled water system specifications for the HP POD 20c.

Feature	Specification
Facility input temperature to the HP POD 20c	12° to 24°C (55° to 75°F)
Max design pressure	1,034 kPa (150 psi)
HP POD 20c pressure drop	172.4 kPa (25 psi)
HP POD 20c water flow rate	454 lpm (120 gpm*)
Chilled water supply and return connections	Two DIN PN16 DN80 flanges

Piping materials

Do not use the following interconnecting piping materials in a closed water system:

- Oxidizing biocides
- Aluminum components
- Brass components with high levels of zinc
- Non-stainless steel iron components
- PVC

IMPORTANT: Even though some PVC grade piping materials are designed to handle the expected water pressure, the use of PVC materials should be reviewed and approved by the customer site engineers.

Power infrastructure installation

When determining the final location of the power connections, consider the following:

- Distance between the facility utilities and the location of the HP POD 20c

- Distance between possible UPS or generator locations and the HP POD 20c
- Requirements for routing electrical feeders (underground or overhead)

The facility power connection must be installed in compliance with local electrical codes and regulations. HP reference electrical installation design is based on a maximum distance of 15.2 m (50 ft) or a line of sight between the disconnect and the HP POD 20c.

Site electrical system

To ensure a complete and safe integration of the HP POD solution with your facility, HP requires that you complete the following actions for the installed electrical system prior to the installation of the HP POD solution:

- Short circuit analysis
- Arc flash study
- Circuit breaker coordination study

These actions must be performed for all associated parts of the electrical power train. The majority of the details and factors required to complete these studies are associated with the existing installed facility infrastructure.

CAUTION: Failure to complete these studies can cause serious issues with the electrical integration of the POD into your electrical system.

Electrical power system configuration

A preliminary meeting with the HP POD Electrical Engineering team is necessary to discuss your decision concerning capacity limitations and the impacts of this decision on the electrical design.

A 1N electrical configuration can be achieved by providing all of the required electrical feeders from a common power source, common switchboards, and transformers.

A 2N electrical configuration can be achieved by feeding parallel power paths from independent power sources, switchboards, and transformers.

IMPORTANT: The required neutral must be provided as part of the 380-415VAC Y direct connection to the HP POD 20c.

IMPORTANT: All 3-Phase Wye feeders for the HP POD 20c require that the neutrals and the equipment grounding conductors remain isolated. Bonding of the two conductors is allowed at the power source only.

Supported facility connections

Environmental control system

The ECS developed for the HP water-cooled POD is a stand-alone control system that requires no external connections with an external site system, BMS, public or private Internet sites, cloud, or wireless system to properly control the POD operation.

The ECS includes Modbus TCP/IP connections through which a variety of data can be retrieved. These capabilities enable you to connect, at your expense, with the stand-alone ECS system to monitor the operating parameters of the POD. It is your responsibility (or your representative's or agent's responsibility) to integrate this communication capability into any existing BMS or monitoring system.

△ **CAUTION:** To ensure that alarm conditions can be identified and resolved, HP recommends that you remotely monitor all alarm conditions. Failure to monitor the alarm conditions can cause delays in appropriate action during an alarm condition.

Additional POD connections

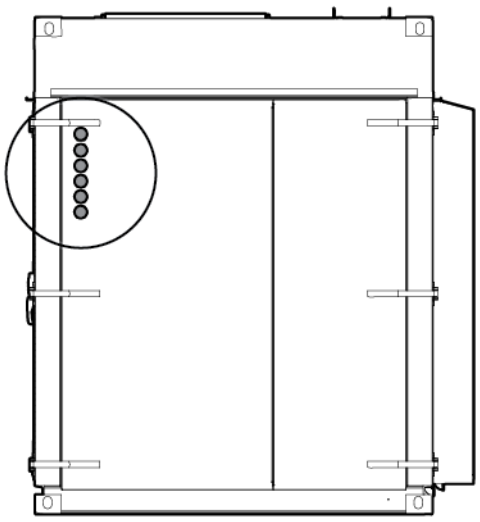
The HP POD 20c provides various connection points to your facility. It is your responsibility to facilitate these connections. HP can make these connections when specifically contracted to deliver these services and a Scope of Work has been drafted, reviewed, and signed for delivery services. Available POD connections include the following:

- Life safety systems
  - EPO
  - Fire detection
  - Fire suppression
- Site communication
  - Phone
  - Access control
- Networking—IT connections

Connection portals

Networking and connection portals are located on the cargo end of the HP POD 20c. Each HP POD 20c has six 6.35-cm (2.5-in) portals for customer data connection. These portals are provided to allow the customer to make connections to the HP POD 20c.

End view shown

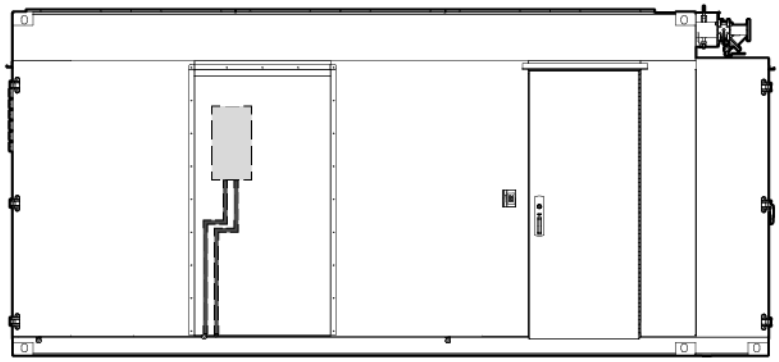


Humidifier

A dedicated water supply and approved drainage is required for the humidifier. For more information about the humidifier, see the *HP Performance Optimized Datacenter 20c User Guide* that is provided with the HP POD 20c.

The following image shows the location of the humidifier drain and water supply.

Side view shown



IMPORTANT: Confirm with local Authorities that condensate water and rain water can be mixed in the same drainage.

HP POD 20c access control

The HP POD 20c is equipped with standard key lock hardware for each personnel entry door and external electrical cabinet. Each personnel entry door includes a door access contact that can be connected to the customer facility security system.

Additional options for controlled access include the following:

- Electronic card reader
- 12-digit access control code keypad
- Magnetic lock on each personnel access door and dynamic hot aisle door

Fire, safety, and access notifications

Dry contacts are provided to enable the connection between the HP POD 20c and the customer's facility. If the HP POD 20c is connected to the customer facility systems, then the alarm conditions of the HP POD 20c can be detected by the facility systems.

It is your responsibility to facilitate these connections. HP can make these connections when specifically contracted to deliver these services and a Scope of Work has been drafted, reviewed, and signed for delivery services.

The customer must provide an independent connection for each system listed in the following table.

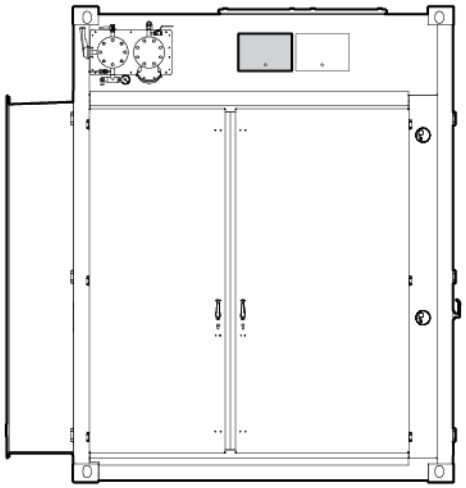
Alarm	**Description**
Fire prevention alarm	Smoke is detected in the HP POD 20c.
Fire suppression system (optional)	The suppression system alarm is activated and gas is dispersed to suppress a fire.
Access control	A door of the POD has been opened.
EPO	The EPO system is activated by manually pressing the EPO button or by a thermal event, and the HP POD 20c is shut down.

The electrical layout of the fire alarm system is described in the schematic drawing that is supplied with the *HP Performance Optimized Datacenter 20c Site Drawing Package*.

Fire box

The communication connections between the fire system and the HP POD 20c are made through the fire box.

Front view shown



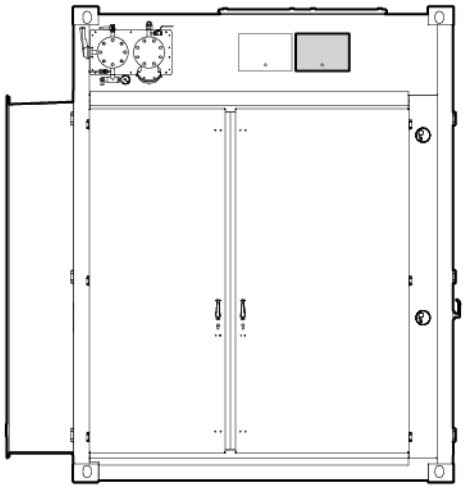
You must make the connections between the facility and the HP POD 20c. For configuration and installation instructions, consult with HP.

Demarcation box

The following communication connections between the customer facility and the HP POD 20c are made through the demarcation box:

- ECS communication
- Access control communication
- Telephone

Front view shown



You must make the connections between the facility and the HP POD 20c. For configuration and installation instructions, consult with HP.

Environmental considerations

Environmental risks

- Avoid placing the HP POD 20c directly along a drainage path or in an area prone to flooding.
- Verify that the HP POD 20c is properly grounded in accordance with national, regional, and local regulations, ordinances, codes, and the product specifications.

Cold weather

The HP POD 20c requires a site chilled water supply and return, humidifier supply and drain, and condensate drains. Extreme cold weather can cause damage to the supply and drain lines. Evaluate the following for additional cold weather protection:

- Regional location of the HP POD 20c
- Exposure of the supply and drain lines to extreme cold temperatures

Extreme cold weather can affect crane and lifting operations. When temperatures drop below -12.2°C (10°F), appropriate consideration must be made with respect to shock loading, crane hydraulics, and possible de-rating of the crane.

Areas prone to lightning or power surges

The HP POD 20c structure and internal components are all bonded together. A common Grounding Electrode Conductor Connection point is provided. Proper bonding and grounding of the HP POD 20c minimizes the effects of a lightning strike. A surge protection device is provided on the HP POD 20c input connection to protect the HP POD 20c electrical system from voltage transients. If your site is in an area that is subject to frequent lightning strikes, the HP POD 20c must be protected in accordance with NFPA 70 (NA) and IEC (EMEA and APJ). HP recommends that you contact a certified lightning protection consultant.

Seismic activity

If your site is in an area that has frequent seismic activity, HP recommends that you contact a seismic activity consultant. If your site is in an area that has high vibration level, HP recommends that you contact a vibration isolation consultant. You must specify the method of anchoring the HP POD 20c, if necessary.

Site plan requirements and actions

Completing a site assessment

HP requires a detailed site assessment prior to planning and preparing the customer site location for the HP POD 20c. Consult with HP to schedule a site assessment.

A standard site assessment visit includes the following tasks:

- Selecting an appropriate site for the HP POD 20c
- Assessing the proposed site for:
  - Measurements for clearances
  - Infrastructure for the final solution
  - Access to utilities
  - Site pad
  - Installation considerations, including locations for delivery trucks, large installation equipment (such as cranes), and storage
  - Electrical infrastructure
  - Chilled water infrastructure
  - Facility network and access control systems
- Developing an engagement plan and verifying customer contacts
- Discussing future development and growth plans

For a complete site assessment checklist, see "Appendix A: HP site assessment (on page 26)."

HP Site Preparation Drawing Package

After receiving a signed purchase agreement, HP provides detailed engineering drawings. These drawings contain information to assist you and your MEP team to prepare the site for POD installation. If there are areas of special interest, HP can work directly with your MEP team to provide additional assistance.

Zoning and permit requirements

You are responsible for compliance of the overall installation in accordance with all local and national regulations, ordinances, codes, and the product specifications.

Project coordination

Your Project Manager must perform the following tasks:

- Coordinate with all trades prior to installation to ensure that trade conflicts are resolved.
- Coordinate the installation and integration of all systems.

- Ensure that the site safety and security programs are properly administered.
- Interface directly with the HP installation project manager to ensure clear lines of communication during the installation and commissioning processes.

Site planning

A comprehensive site plan assists with the site design (MEP) and ensures the best possible HP POD 20c installation process. When creating a site plan, consider the following information:

- HP POD 20c site requirements detailed in this document
- HP POD 20c site preparation drawing package
- HP POD 20c readiness checklist ("HP POD 20c site readiness checklist" on page 29)
- HP POD 20c installation (on page 23)

The HP team can assist you by answering questions and help to guiding you throughout the process.

HP POD 20c installation

HP POD 20c installation includes the following:

- Installation equipment staging (on page 23)
- HP POD 20c lifting layout (on page 23)
- HP POD 20c storage requirements (on page 24)
- Additional structures (on page 25)

Installation equipment staging

Staging for the following items must be identified and considered:

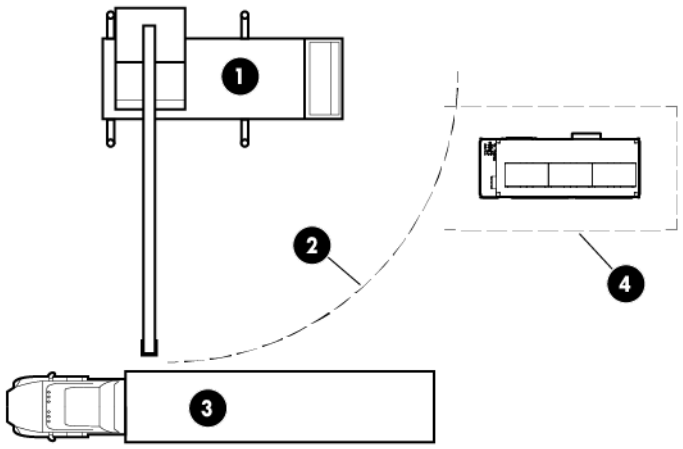
- Truck and component staging
- Installation equipment staging
- Site traffic
- Regulatory or local permits

HP POD 20c lifting layout

When preparing a site plan, identify where to place the HP POD 20c and the equipment that is used for assembly. The following figure shows an HP POD 20c assembly site and includes:

- HP POD 20c location
- Crane location

- Assembly equipment locations



Item	Description
1	Crane
2	Reach
3	Truck
4	Area clear for scissors lift and forklift

HP POD 20c lifting requirements

WARNING: The only approved method for lifting the HP POD 20c is the use of a spreader bar harness. Lifting an HP POD 20c in any other manner can cause damage to the HP POD 20c and void your warranty. The harness and lifting connections must be perpendicular to the lifting blocks.

HP POD 20c storage requirements

If the site is not ready for assembly and operation, determine a location for storage when creating the site plan.

CAUTION: The HP POD 20c must maintain 20% relative humidity to minimize condensation and oxidation within the HP POD 20c.

CAUTION: While being stored, the HP POD 20c must be kept in a level position even if stored on a trailer.

Changes in ambient temperatures can cause condensation in a non-operational HP POD 20c. If the HP POD 20c is placed in storage or is in non-operating mode for over 72 hours, HP recommends using one of the following methods to minimize condensation and oxidation within the HP POD 20c:

- Desiccant unit
- Desiccant material
- Heater with a fan
- Air conditioner with a heater strip

Consult with HP Services to determine the most effective method.

Additional structures

If a customer-provided vestibule or other structure is installed and connected to the HP POD 20c, the following specifications must be maintained:

- To protect the HP POD 20c and ensure a waterproof barrier, flashing must be installed to the exterior of the HP POD 20c in the location where the other structure is attached.
- Access landings might be required to maintain the required access to the HP POD 20c electrical panels.

Appendix A: HP site assessment

HP POD 20c site assessment checklist

During a survey of the readiness of a proposed customer site for the HP POD 20c, the site is inspected for the following:

- Accessibility of machinery for the transportation and installation of the HP POD 20c
- Assessment of the suitability of the site infrastructure for installing the HP POD 20c and for supporting infrastructure preparation and serviceability requirements

HP responsibilities

Item	Description	Yes	No	N/A	Initial
1. Engagement plan	Develop an engagement plan with specific requirements relating to the proposed installation site.				
2. Site visits	Schedule site visits on mutually acceptable dates, during normal HP business hours.				
3. Test equipment	Document any test equipment used in the customer report.				
4. Installation site review	Review and discuss the proposed installation site with the customer. This initial review includes physical examination of the proposed installation site and, at the sole discretion of HP, can include physical measurements of the area size and clearances.				
5. Indoor/outdoor installation	Identify whether the HP POD 20c installation is indoors or outdoors as this can affect the degree and type of infrastructure required and the mounting needs.				
6. Site pad	• Inspect the proposed installation site to assess compliance with the HP POD 20c mounting specifications. Ensure that the customer is fully aware of the following requirements: • Proper support capabilities must exist. If the customer intends to edge or point load on the utility and cargo ends, there must be support in the center to prevent deflection. • Upon installation, the POD structure must be leveled to ≤ 0.5°, which can be checked at that time with a surveyor's transit. • Shimming is allowed around the perimeter of the POD. • Place shims in increments across the length of the HP POD 20c to ensure that the HP POD 20c is level. If significant shimming is required, shims should be spaced no less than 1.2 m (4 ft) apart to ensure sufficient load transfer.				
7. Materials and construction inspection	Visually inspect the materials and construction at the proposed installation site to identify issues that can impact the HP POD 20c installation. Verify that the area is adequate for truck delivery, staging, and crane location.				

Item	Description	Yes	No	N/A	Initial
8. Clearances	Inspect the proposed installation site to confirm clearance requirements for installation and serviceability per the HP POD 20c specifications. Necessary clearances are determined, in part, based on the specific installation plans and infrastructure design. Location, orientation, and planned utilization can affect the necessary clearances. Consider future planning for the space around the installation site.				
9. Support infrastructure location	Evaluate the HP POD 20c installation site in relation to the planned support infrastructure location. Conduit lengths and the utility pathway design must be taken into consideration in the planning stages. The proposed support infrastructure design and the location of required utilities are discussed with the customer's site engineering personnel to identify elements that can impact the HP POD 20c installation site decisions.				
10. Support infrastructure for access requirements	Evaluate the proposed installation site for the HP POD 20c and the support infrastructure for access requirements. The evaluation is based on the information provided by the customer at the time of the site visit. In the absence of installation-specific information, general requirements are used as the basis for the evaluation. The delivery path is visually examined and discussed with the customer's site engineering personnel to identify obstacles to installation.				
11. Site engineering interviews	Conduct interviews with the customer's site engineering personnel and site facilities personnel to gather information related to the origin of the power source and network services that are proposed for use with the HP POD 20c. HP must visually inspect the proposed power protection equipment. Means of delivery, connections, and pathways are documented.				
12. Capacity of electrical infrastructure	Based on the review of customer-provided site documentation (such as single-line and as-built drawings), examine equipment panels and monitoring system data, as available. HP must determine whether adequate capacity exists in the current electrical infrastructure to be used or if additional study is required. Determine if the level of redundancy that is required as stated by the site engineering personnel can be provided by using the existing infrastructure. This takes into consideration the proposed installation site of the HP POD 20c, the potential HP POD 20c payload, and the customer stated redundancy requirement. Components can include generators, UPSs, and switch gear.				
13. Chilled water infrastructure	Determine the overall chilled water capacity, available flow rates, and supply/return temperature restrictions. Determine if any site specific requirements mandate additional chilled water equipment, such as heat exchangers or mixing apparatus. Locate any existing or planned supply/return headers.				
14. Access control	Conduct interviews with the customer site engineering personnel to determine the level of access control that is required for the HP POD 20c and its infrastructure. The proposed installation site is assessed for suitability in relation to the customer requirements.				

Item	Description	Yes	No	N/A	Initial
15. Recommendations	Following the HP installation site visit, analyze the data that is collected and prepare a report of findings. HP must identify potential obstacles to installation and make recommendations for any additional testing or changes to the installation plan.				

Customer responsibilities

Item	Description	Initial
1. Point of contact information	Provide HP with the name and telephone number of the designated point of contact for the purposes of this service.	
2. Service listing information	Provide all information that is required under this service listing or reasonably determined by HP to be necessary to deliver the service, including but without limitation, any documentation (internal or external) regarding prior plans or investigations used to identify the proposed installation site.	
3. Timely response	Provide a timely response (such as, in a time period that does not adversely affect the HP scheduled performance of the service) to all requests for information by HP.	
4. Access to subject areas and support areas	Provide HP access to all subject areas and support areas, including the proposed installation site and the mechanical or electrical infrastructure provided to support the HP POD 20c.	
5. Badge access	Provide HP badge access or an escort for the duration of the site visit to facilitate required access to all necessary areas.	
6. Site engineering personnel	Customer site engineering personnel familiar with the proposed installation site and personnel responsible for the maintenance and support of the existing infrastructure must be available to answer questions.	
7. Documentation	Provide HP copies of all available mechanical and electrical system design documentation, including as-built drawings and electrical single-line drawings. As appropriate to the specific location, provide HP with campus maps, building drawings, floor plans, and other relevant prints to assist in the documentation and evaluation of the proposed installation site.	
8. Network infrastructure information	Provide HP information regarding the planned network infrastructure connection points and pathways.	
9. Permission for Photographs	Grant HP permission to take photographs for report illustration purposes.	
10. Project logistics	Arrange site-specific project logistics at the time of scheduling. Failure to provide necessary authorizations can limit the effectiveness of the service and can, at the discretion of HP, impact scheduling or result in the postponement of the service.	
11. Business visas	Provide assistance in instances where a temporary business visa is required for HP personnel to visit the site. This assistance typically takes the form of preparing a letter of invitation. In some cases, a formal request must be made by the local company for which the work is taking place, if applicable.	

Appendix B: Preparing for delivery

Pre-delivery tasks

Allow adequate time for planning, scheduling, obtaining permits, design approval, inspections, and so on.

Installation prerequisites

Before installing the HP POD 20c, verify that the following prerequisites are met:

- All components are delivered to the facility.
- The HP POD 20c and power distribution components are in the final location.
- Facility power, water, and drainage are at the final location.
- Provisions for properly grounding the HP POD 20c are made.
- Required clearances exist, including overhead.
- All trade personnel required for assembly are coordinated.

HP POD 20c site readiness checklist

Before installing the HP POD 20c, follow all steps listed in this guide, the site plan, and the following checklists.

Architectural/environmental considerations

Item	Description	Initial
1	Verify that the site location supplies sufficient locations for support. Ensure that upon installation the POD can be leveled to less than or equal to 0.5°. If edge or point loading is used, ensure a center support can be accomplished using shims and so on, to ensure that the POD can be properly leveled. Shimming is around the perimeter in increments. Use a surveyor's transit upon installation to check the POD leveling requirements.	
2	Verify that the pad can support the total weight of the HP POD 20c solution by verifying that load calculations have been performed by your engineering team.	
3	Verify that the site has provisions for grounding.	
4	Verify the HP POD 20c is not in the direct path of any external heat loads, such as generators.	
5	Determine the average local temperatures and ensure that adequate environmental protection is provided, such as cold weather protection, if required.	
6	Verify that the site altitude is less than 3,048 m (10,000 ft).	
7	When installing on an elevated surface, verify that the maximum height requirements for the circuit breaker actuator meet the national, regional, and local regulations. Verify that proper landings and the catwalk are planned for electrical cabinet access.	
8	Verify the planning for required egress routes for all HP POD 20c personnel doors, cargo doors, and service area doors, including landings, the catwalk, and stairs.	
9	Verify that the local Authorities are contacted, all applicable codes and site-specific location guidelines are reviewed, and all required permits are obtained.	

Item	Description	Initial
10	Verify that the site location has clearances for the HP POD 20c installation, including any permanent structures, such as fences, walls, vestibules, and buildings.	
11	Verify that all utilities, overhead and underground, are identified to maintain required clearance.	
12	Verify that there is adequate clearance around the HP POD 20c for door operation, installation, and maintenance equipment.	
13	Verify that the site location and site pads are marked for any transformer, external switchboard, generators, and powerhouses.	
14	Verify that the site has provisions for proper grounding and that the site location includes a grounding electrode system.	
15	Verify that the site location has adequate lighting for the HP POD 20c installation.	
16	Verify that a truck and equipment staging areas are identified.	
17	Verify the location for the fuel tanks for generators, powerhouses, and other equipment, if applicable.	
18	Verify the locations for cranes off-loading and operation during HP POD 20c installation.	
19	Verify site access and clearances for equipment, including the crane and forklifts. A clear path to the site must be maintained with clearance for all gates, headers, utility lines, and so on.	
20	Verify that the locations for storage and trash disposal are identified.	
21	Verify that the safety equipment is planned for and in place in accordance with the customer's site safety program.	
22	Verify the site interfaces and locations which connect to the fire alarm, access control system, and communication system to the HP POD 20c to ensure that the POD can be properly connected to the site BMS.	
23	Verify that proper disposal methods are used for existing or potentially contaminated and/or hazardous materials.	
24	Verify the availability of security systems or equipment, including site fences, which are required after construction.	
25	Verify the availability of temporary facilities associated with the relocation of existing services and operations.	
26	Verify that all work relating to soil testing, removal, and site remediation is complete.	
27	Verify that a temporary or permanent load bank is available, if applicable.	
28	Verify the location of the EPO system external to the powerhouses, if applicable.	
29	Verify the location of the remote electronic monitoring system.	
30	Verify that tie-downs and other Authority-required facilities for the HP POD 20c and power containers are complete at least one week prior to arrival of HP-provided equipment.	

General Water Supply

Item	Description	Initial
1	Verify that the site drainage is complete, and the HP POD 20c is not in a drainage path or flood prone area. HP recommends placing the HP POD 20c on a raised site pad to prevent water from entering the HP POD 20c.	
2	Verify that the humidification water quality meets or exceeds these standards, which are essentially drinking water standards.	
3	Verify the humidification water supply isolation valve is installed for each POD.	

Chilled Water Supply

Item	Description	Initial
1	Verify the chilled water supply and return headers are accessible, are in the appropriate location, and are 80 cm (3 in) in diameter.	

Item	Description	Initial
2	Verify that the chilled water supply temperature meets the minimum POD chilled water supply temperature of 12°C (55°F).	
3	Verify that a sufficient chilled water flow rate is available.	
4	If necessary, verify that the customer-required chilled water return temperatures can be attained.	

Power Requirements

Item	Description	Initial
1	Verify that the short circuit analysis, arc flash, and circuit breaker coordination studies are complete. Verify power work is completed according to the approved conduit routing drawings that show the exact routes, plan view, sections, and elevations.	
2	Verify that temporary site power for installation and construction is planned and available, if applicable.	
3	Verify that adequate site power exists per the HP POD 20c requirements.	

General

Item	Description	Initial
1	Verify the utility connection to the HP POD 20c and any required metering equipment.	
2	Verify the third-party commissioning services that might be required by the owner.	
3	Verify that the HP Project Team coordinates with other site construction activities.	

Power infrastructure installation

When determining the final location of the power connections, consider the following:

- Distance between the facility utilities and the location of the HP POD 20c
- Distance between possible UPS or generator locations and the HP POD 20c
- Requirements for routing electrical feeders (underground or overhead)

The facility power connection must be installed in compliance with local electrical codes and regulations. HP reference electrical installation design is based on a maximum distance of 15.2 m (50 ft) or a line of sight between the disconnect and the HP POD 20c.

Appendix C: Regulatory compliance notices

HP POD 20c regulatory compliance

The HP POD 20c complies with the following regulatory standards.

Standard	Certification level	Standard title
IEC/EN 60950	"Intertek Tested and Certified"	• IEC/EN 60950—*Standard for Safety Information Technology Equipment, Part 1: General Requirements*, Issue: 2006 • IEC/EN 60950—*Standard for Safety Information Technology Equipment, Part 22: Equipment to be Installed Outdoors*, Issue: 2006
IBC 2009	Designed to Comply With the applicable requirements	*2009 International Building Code*, © 2010 International Code Council, Inc.

Safety and IEC compliance

The HP POD 20c is examined, tested, and found to be in compliance with IEC/EN 60950 Part 1 and Part 22 as an Information Technology Product. For more information, see "HP POD 20c regulatory compliance (on page 32)."

The HP POD 20c is not suitable for long-term human occupancy. The HP POD 20c is Listed as a Product that provides service access areas for periodic maintenance and service. These areas must be used only by owner-authorized and qualified personnel who are trained in the maintenance and service of the HP POD 20c components.

IMPORTANT: Before installing the HP POD 20c, consult your local Authorities for applicable regulations and to review site-specific location guidelines. If needed, obtain any necessary permits.

Additional considerations for safety and Electrical compliance are as follows:

- The HP POD 20c is Certified as an Information Technology Product to IEC/EN 60950 Part 1 and Part 22.
- The HP POD 20c is evaluated as a "non-inhabitable product" that provides "service access" areas for customer-authorized, qualified, and trained service personnel.
- The electrical connections of the HP POD 20c are evaluated as feeder connections for connection to an existing facility, and are not suitable as "service entrance" for connection to the utility.
- The HP POD 20c is designed for stationary installation outdoors in a Pollution Degree 3 environment, in restricted access locations, with field wiring terminals provided for permanent supply connections.
- The HP POD 20c meets the following ratings.

Feature	Specification
Category	Rated Overvoltage Category III
Protection	Surge protection device

Feature	Specification
Class	Class1
Ambient temperature	2°C to 54°C (35.6°F to 129.2°F)
Relative humidity	0% to 100% humidity

- As part of the overall certification, relevant sections of the International Building Code have been applied as part of the design and evaluation. The current design supports wind loads up to 144.84 kph (90 mph).

Safety and regulatory compliance

For safety, environmental, and regulatory information, see *Safety and Compliance Information for Server, Storage, Power, Networking, and Rack Products*, available at the HP website (http://www.hp.com/support/Safety-Compliance-EnterpriseProducts).

Turkey RoHS material content declaration

Türkiye Cumhuriyeti: EEE Yönetmeliğine Uygundur

Ukraine RoHS material content declaration

Обладнання відповідає вимогам Технічного регламенту щодо обмеження використання деяких небезпечних речовин в електричному та електронному обладнанні, затвердженого постановою Кабінету Міністрів України від 3 грудня 2008 № 1057

Warranty information

HP ProLiant and X86 Servers and Options (**http://www.hp.com/support/ProLiantServers-Warranties**)

HP Enterprise Servers (**http://www.hp.com/support/EnterpriseServers-Warranties**)

HP Storage Products (**http://www.hp.com/support/Storage-Warranties**)

HP Networking Products (**http://www.hp.com/support/Networking-Warranties**)

Glossary

APJ

Asia Pacific Japan

BMS

building management system

door

A hinged portion of an enclosure that covers an opening.

ECS

environmental control system

EMEA

Europe, Middle East, and Africa

EPO

emergency power off

equipment

A general term, including fittings, devices, appliances, luminaires, apparatus, machinery, and the like used as a part of, or in connection with, a modular data center. (Source: NEC.)

IEC

International Electrotechnical Commission

ISO

International Organization for Standardization

labeled

Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

listed

Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic

inspection of production of listed equipment or materials or periodic evaluation of services, and whose listing states that either the equipment, material, or service meets appropriate designated standards potential of not more than 42.4 V (DC or peak) supplied by a primary battery or by an isolated secondary circuit, and where the current capacity is limited by an overcurrent device, such as a fuse, or by the inherent capacity of the secondary transformer or power supply, or a combination of a secondary winding and an impedance. A circuit derived from a line-voltage circuit by connecting a resistance in series with the supply circuit to limit the voltage and current is not identified as a low-voltage limited energy circuit. or has been tested and found suitable for a specified purpose.

The means for identifying listed equipment might vary for each organization concerned with product evaluation, some of which do not recognize equipment as listed unless it is also labeled. Use of the system employed by the listing organization allows the authority having jurisdiction to identify a listed product.

overcurrent protection

A device designed to open a circuit when the current through it exceeds a predetermined value. The ampere rating of the device is selected for a circuit to terminate a condition where the current exceeds the rating of conductors and equipment due to overloads, short circuits and faults to ground.

structure

Enclosure of sufficient size to enable entry of personnel.

UL

Underwriters Laboratory

UPS

uninterruptible power system

VESDA

very early smoke detection apparatus

Documentation feedback

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